

What is claimed is:

1. A rotation-to-linear motion transforming apparatus comprising:

5 an eccentric cam coupled to a torque input shaft, said eccentric cam being rotated eccentrically with respect to the torque input shaft;

a cam ring which is placed in contact of an inner wall thereof with said eccentric cam and to be urged by said eccentric cam to rotate, said cam ring having a flat surface formed on an outer periphery thereof;

a plunger placed to be movable linearly in a direction perpendicular to an axis of rotation of said eccentric cam, said plunger having a flat surface which is pressed against said cam ring in slidable abutment with the flat surface of said cam ring so as to hold said cam ring from rotate to move said plunger linearly; and

a safeguard provided in said cam ring which is responsive to application of a physical load greater than a given degree in a direction of rotation of said eccentric cam to undergo breakage.

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2. A rotation-to-linear motion transforming apparatus as set forth in claim 1, wherein said safeguard is provided in a portion of said cam ring which is out of abutment with said plunger and to which a tensile stress is added when resistance to sliding motion of said cam ring relative to said plunger increases.

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3. A rotation-to-linear motion transforming apparatus as set forth in claim 1, wherein said safeguard is implemented by a groove formed in at least one of an outer periphery and an inner periphery of said cam ring.

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4. A fuel injection pump for an engine comprising:
a housing having formed therein a cam chamber into which fuel is supplied;

an eccentric cam disposed within the cam chamber of said housing in mechanical connection with a torque input shaft into which torque outputted by an engine is inputted, said eccentric cam being rotated eccentrically with respect to the torque input shaft;

a cam ring which is placed in contact of an inner wall thereof with said eccentric cam and to be urged by said eccentric cam to rotate, said cam ring having a flat surface formed on an outer periphery thereof;

a plunger placed to be movable linearly in a direction perpendicular to an axis of rotation of said eccentric cam, said plunger having a flat surface which is pressed against said cam ring in slidable abutment with the flat surface of said cam ring so as to hold said cam ring from rotating, thereby urging said plunger to reciprocate to increase and decrease a volume of a fuel pressurizing chamber cyclically; and

a safeguard provided in said cam ring which is responsive to application of a physical load greater than a given degree in a direction of rotation of said eccentric cam to undergo breakage.

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5. A rotation-to-linear motion transforming apparatus as set forth in claim 4, wherein said safeguard is provided in a portion of said cam ring which is out of abutment with said plunger and to
5 which a tensile stress is added when resistance to sliding motion of said cam ring relative to said plunger increases.

6. A rotation-to-linear motion transforming apparatus as set forth in claim 4, wherein said safeguard is implemented by a groove
10 formed in at least one of an outer periphery and an inner periphery of said cam ring.